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EXAMINER	
FITZPATRICK, ATIBA O	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/556,807	KNOX ET AL.	
	Examiner	Art Unit	
	ATIBA O. FITZPATRICK	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) *15-34,37-40 and 50-53* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14,35,36 and 41-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 November 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/02/2008, 11/14/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's election without traverse of Group I: claims 1-14, 35, 36 and 41-49 in the reply filed on 01/07/2009 is acknowledged.

Specification

The abstract of the disclosure is objected to because of grammatical errors. Correction is required. The excerpt "A smoke detector (10) is disclosed which uses a beam of radiation such as a laser (16), to monitor a region, such a room (12)" is grammatically incorrect. Should this read "A smoke detector (I0) is disclosed which uses a beam of radiation such as a laser (16), to monitor a region, such **[as]** a room (12)" instead? The excerpt "The laser may have a modulated output (38) so that images captured without the laser can be used as a reference point and compared to images taken with the laser on, to assist in determining the level of scattered light (30) compared to ambient light" is grammatically incorrect. Should the excerpt read "The laser may have a modulated output (38) so that images captured without the laser can be used as a reference point and compared to images taken with the laser to assist in determining the level of scattered light (30) compared to ambient light" instead? See MPEP § 608.01(b).

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

Applicant is advised that should claims 5, 6, 7, 9, 10, 11, 12, 13, and 14 be found allowable, claims 41, 42, 43, 44, 45, 46, 47, 48, and 49 respectively will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 101

Claims 1-14 and 41-49 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent and recent Federal Circuit decisions indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (in particular, a machine), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claims recite a series of steps or acts to be performed, the claims neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. For example, the body of the claims should indicate that the significant steps

are carried out by a processor. Considering claim 1, although it can be interpreted that an apparatus is required for emitting a beam of radiation, this step is not the significant step of the method since the emitting is understood to be a pre-solution. Therefore, the significant step of "detecting a variation in images of the region indicating the presence of the particles" is understood to be achievable without the use of a machine (i.e. as claimed). That is, a person can view the images and perceive the variation in the images. No transformation of matter is claimed. While the claim limitations can be interpreted to show manipulation of data, the result of the manipulation is not depicted in a human perceivable format. The depending claims do not remedy the deficiencies of claim 1.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 9, 35, 36, 41 and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by USPN 3788742 (Garbundy).

As per claim 1, Garbundy teaches a method of detecting particles including emitting a beam of radiation into a monitored region and detecting a variation in images of the region indicating the presence of the particles **(Garbundy: abstract: "two spectral regions… invention utilizes the polarization characteristics of the backscattered radiation, incurred from processes such as resonant imprisonment in the monitored gas, to determine the presence of the molecular species being**

detected"; col 3, lines 1-5: "distinguishing between various gaseous molecular densities"; col 3, lines 7-40: "detection of molecules... atoms as well... In a single scattering process, the reradiated light has essentially the same frequency as the laser. Thus, it can be expected that the light scattered from the layer of initial penetration has still essentially the same spectral profile as the laser radiation. However, the light from deeper layers of penetration of the primary beam undergoes many capture and reemission processes due to electron transitions of the resonant molecule. During each process (depending on its duration compared to the period the molecule is free from perturbation), there takes place a certain average amount of detuning of the original frequency of the laser. The reemitted light is therefore quite broadened. Under the following simplified assumptions it is possible to assess the effect of various densities"; col 4, lines 13-47: "discriminating against echoes from aerosols or surfaces which produce much less, if any, depolarization... frequency discrimination"; col 5, lines 20-35: "remote monitoring of gaseous and particulate effluents pinpointed over industrial smokestacks, behind vehicle exhaust, and the like as well as of larger volumes of pollution over a specific area"; col 5, lines 45-67: "any smoke or aerosol"; col 7, lines 1-5: "vibrational-rotational"; col 8, lines 35-43: "by measuring the intensity of the echo returned in response to laser radiation at varying frequencies, the product of molecular density n and depth z of a gas layer can be determined"; col 10, lines 1-14: "detect particulates of various sizes"; col 10, lines 15-47: "the image of the scattering volume as observed by the sensor

(receiver)"; Fig. 1-3, 7).

As per claim 2, Garbundy teaches a method as claimed in claim 1 including modulating the beam of radiation **(Garbundy: See arguments made for rejecting claim 1. abstract: "tuned to a wavelemgth"; col 5, lines 45-67: "optical frequency of the laser beam is tuned, and may be tuned in succession, to the resonances of the gases of interest"; col 6, lines 27-47; col 10, line 57 – col 11, line 30: "emits pulses"; Fig. 5)**.

As per claim 3, Garbundy teaches a method as claimed in claim 2, wherein scattered radiation within the zone is represented in one or more segments of a corresponding image, which allows for the location of the particles in the region to be identified **(Garbundy: See arguments made for rejecting claim 2. abstract: "two spectral regions... backscattered irradiation"; col 11, lines 1-32: "define the location in the gas from which the scattered radiation is accepted by the delay time 2L/c; where L is the distance from the source to the monitored gas volume"; Fig. 5)**.

As per claim 4, Garbundy teaches a method as claimed in claim 3, wherein the location of the particles is determined in accordance with a geometric relationship between the locations of a source of emitted radiation, a direction of the emitted radiation and a point of image detection wherein, the geometric relationship is determined from the images **(Garbundy: See arguments made for rejecting claims 3 and 9. Figs. 1, 5-7; col 10,**

lines 1-14: "backscattered radiation can be measured as a function of frequency and time to identify the various contaminant gases and to detect particulates of various sizes"; col 8, lines 34-43).

As per claim 5, Garbundy teaches a method as claimed in claim 1, wherein the detected variation is an increase in scattered radiation intensity **(Garbundy: See arguments made for rejecting claim 1: col 10, lines 15-47: "As the density increases, the intensity of the backscattered light grows with it... The methods of this invention have in common that they evaluate relative, rather than absolute, intensities of the scattered light. This has the advantage that the laser energy per pulse does not have to be known and that the image of the scattering volume as observed by the sensor (receiver)")**.

As per claim 9, Garbundy teaches a method as claimed in claim 1, comprising directing the radiation along a path and identifying a target in the images, the target representing a position at which the radiation is incident on an objective surface within the region **(Garbundy: See arguments made for rejecting claim 1. col 7, lines 7-31: "incident on a gas of density... path"; Fig. 1,5-7)**.

Arguments made in rejecting claims 35 and 36 are analogous to arguments for rejecting claim 1 **(Garbundy: See arguments made for rejecting claim 1. Also see Figs. 5, 8; col 14, lines 43-56)**.

Arguments made in rejecting claims 41 and 44 are analogous to arguments for rejecting claims 5 and 9 respectively.

Claims 1-3, 5, 6, 9, 35, 36, 41 and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by USPGPubN 20020135490 (Opitz).

As per claim 1, Opitz teaches a method of detecting particles including emitting a beam of radiation into a monitored region and detecting a variation in images of the region indicating the presence of the particles **(Opitz: Figs. 1, 2; abstract; paras 6-10, 12-15. Note that smoke plumes comprise particles.)**.

As per claim 2, Opitz teaches a method as claimed in claim 1 including modulating the beam of radiation **(Opitz: See arguments made for rejecting claim 1: para 14)**.

As per claim 3, Opitz teaches a method as claimed in claim 2, wherein scattered radiation within the zone is represented in one or more segments of a corresponding image, which allows for the location of the particles in the region to be identified **(Opitz: See arguments made for rejecting claim 1: para 10, 22, 23)**.

As per claim 5, Opitz teaches a method as claimed in claim 1, wherein the detected variation is an increase in scattered radiation intensity **(Opitz: See arguments made**

for rejecting claim 1: abstract: "sum of image elements of the digitalized image deviating by at least one first threshold value from the reference image is determined. An alarm signal is generated when the sum reaches or surpasses a second threshold value. The device for performing the method has a video camera and a matching light source arranged in a dark field arrangement").

As per claim 6, Opitz teaches the method as claimed in claim 5, wherein the increase is assessed with reference to a threshold value **(Opitz: abstract: "sum of image elements of the digitalized image deviating by at least one first threshold value from the reference image is determined. An alarm signal is generated when the sum reaches or surpasses a second threshold value. The device for performing the method has a video camera and a matching light source arranged in a dark field arrangement"; para 6, 9)**.

As per claim 9, Opitz teaches a method as claimed in claim 1, comprising directing the radiation along a path and identifying a target in the images, the target representing a position at which the radiation is incident on an objective surface within the region **(Opitz: See arguments made for rejecting claim 1: Note that the smoke plume or a particle within the smoke plume can be understood to be the target. The emitted light is clearly incident on the target and is directed along a path as shown in Fig. 2. The targets (image elements) are detected in the image)**.

Arguments made in rejecting claims 35 and 36 are analogous to arguments for rejecting claim 1 **(Opitz: See arguments made for rejecting claim 1)**.

Arguments made in rejecting claims 41, 42, and 44 are analogous to arguments for rejecting claims 5, 6, and 9 respectively.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6-8, 13, 14, 42, 43, 48, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPGPubN 20020135490 (Opitz) as applied to claims 1 and 5 above, and further in view of USPN 3788742 (Garbundy).

As Claim 6, Opitz and Garbundy teaches the method as claimed in claim 5 **(Opitz and Garbundy: See arguments made for rejecting claims 1 and 5 above)**, wherein the increase is assessed with reference to a threshold value **(Opitz: abstract: "sum of image elements of the digitalized image deviating by at least one first threshold value from the reference image is determined. An alarm signal is generated when the sum reaches or surpasses a second threshold value. The device for performing the method has a video camera and a matching light source arranged**

in a dark field arrangement"; para 6-10).

Thus, it would have been obvious for one of ordinary skill in the art at the time the invention was made to implement the teachings of Garbundy into Opitz since Opitz suggests a system for emitting radiation directed to an area potentially encompassing a smoke stack/plume in order to detect the presence of the smoke stack/plume in general and Garbundy suggests the beneficial use of a system for emitting radiation directed to an area potentially encompassing a smoke stack/plume in order to detect the presence of the smoke stack/plume as for "determining the presence, density, range and depth of a particular molecular species in a gas distribution" (Garbundy: col 1, lines 5-10) in the analogous art of image processing. Furthermore, one of ordinary skill in the art at the time the invention was made could have combined the elements as claimed by known methods and, in combination, each component functions the same as it does separately. One of ordinary skill in the art at the time the invention was made would have recognized that the results of the combination would be predictable.

As Claim 7, Opitz in view of Garbundy teaches the method as claimed in claim 6, wherein the threshold value is calculated by averaging integrated intensity values from the images **(Opitz: See arguments made for rejecting claim 6; para 10, 15. Note that the average values of areas present in the prior image that is compared to the average values of areas in the current image can be understood as thresholds since these values are used to determine whether or not the latter average values**

deviate from the prior average values. Since the average values of are taken over different image areas, they are different. Note that the accumulation of light photons in CCD or CMOS photodetectors is integration; Fig. 1).

As Claim 8, Opitz in view of Garbundy teaches the method as claimed in claim 7, comprising assigning different threshold values for different spatial positions within the region **(Opitz: See arguments made for rejecting claim 6, 7; para 10)**.

As Claim 13, Opitz in view of Garbundy teaches a method as claimed in claim 1, wherein the images are processed as frames which are divided into sections which represent spatial positions within the monitored region **(Opitz: See arguments made for rejecting claim 1 and 6: Note that the prior image and subsequent image of the scene are understood as "processed as frames")**.

As Claim 14, Opitz in view of Garbundy teaches a method as claimed in claim 13, comprising monitoring intensity levels in associated sections of the images and assigning different threshold values for different spatial positions within the region which correspond to the associated sections **(Opitz: See arguments made for rejecting claim 1, 6, and 7)**.

Arguments made in rejecting claims 42, 43, 48, and 49 are analogous to arguments for rejecting claims 6, 7, 13, and 14 respectively.

Claims 10 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 3788742 (Garbundy) as applied to claim 9 above, and further in view of USPN 3688298 (Miller).

As per claim 10, Garbundy teaches a method as claimed in claim 9, wherein a location of the target in the images is monitored **(Garbundy: See arguments made for rejecting claims 1 and 9. Figs, 1, 5-7)**. Garbundy does not teach the emission of radiation is ceased in response to a change in the location of the target. Miller teaches the emission of radiation is ceased in response to a change in the location of the target **(Miller: abstract: "A photo cell is stationed at the end of the path of laser light for deactivating the laser and actuating an alarm signal when the beam of light is broken by an object such as an intruder moving through the beam"; col 1, lines 52-67: "instantaneously terminating the generation of the beam when the beam is broken by an object or person moving through the beam"; Fig. 3)**.

Thus, it would have been obvious for one of ordinary skill in the art at the time the invention was made to implement the teachings of Miller into Garbundy since Garbundy suggests a system for detecting a target using a laser in general and Miller suggests the beneficial use of a system for detecting a target using a laser wherein detected motion of the target causes the laser to be deactivated as to "safeguard the intruder, innocent or otherwise" in the analogous art of image processing. Furthermore, one of ordinary

skill in the art at the time the invention was made could have combined the elements as claimed by known methods and, in combination, each component functions the same as it does separately. One of ordinary skill in the art at the time the invention was made would have recognized that the results of the combination would be predictable.

Arguments made in rejecting claim 45 are analogous to arguments for rejecting claim 10.

Claims 11, 12, 46, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 3788742 (Garbundy) as applied to claim 1 above, and further in view of JPN 362153780 (Sakagami).

As per claim 11, Garbundy teaches a method as claimed in claim 1, comprising identifying a location of an emitter **(Garbundy: See arguments made for rejecting claim 1. col 5, lines 45-67: "The time of flight for a laser pulse 10 to and from the volume element 14 is an accurate measure of the range of the volume element 14 from the source 12")**. Garbundy does not teach comprising identifying a location of an emitter in the images. Sakagami teaches comprising identifying a location of an emitter in the images **(Sakagami: abstract: "To perform the detailed and accurate display of an image, by simple constitution wherein a plurality of light source arrays are rotated at a high speed and the light sources of light source bars are arranged so**

as to shift the positions thereof to each other allowing the loci of the light sources". The loci identify the location of the light sources in the display image).

Thus, it would have been obvious for one of ordinary skill in the art at the time the invention was made to implement the teachings of Sakagami into Garbundy since Garbundy suggests a light emitting imaging system in general and Sakagami suggests the beneficial use of a light emitting imaging system wherein the location of an emitter in the image is identified as to "perform the detailed and accurate display of an image" (Sakagami: abstract) in the analogous art of image processing. Furthermore, one of ordinary skill in the art at the time the invention was made could have combined the elements as claimed by known methods and, in combination, each component functions the same as it does separately. One of ordinary skill in the art at the time the invention was made would have recognized that the results of the combination would be predictable.

As per claim 12, Garbundy in view of Sakagami teaches a method as claimed in claim 11, comprising determining an operating condition of the emitter based on radiation intensity at the identified location of the emitter **(Garbundy: See arguments made for rejecting claim 11. Fig. 1: 10, 16; col 5, lines 45-67. When the intensity is returned (scattered) back to the receiver which is located in close proximity to the emitter, a pulse being received denotes that a corresponding pulse was sent from the**

emitter. Sakagami: See arguments made for rejecting claim 11.).

Arguments made in rejecting claims 46 and 47 are analogous to arguments for rejecting claims 11 and 12 respectively.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Atiba Fitzpatrick whose telephone number is (571) 270-5255. The examiner can normally be reached on M-F 10:00am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on (571)272-7413. The fax phone number for Atiba Fitzpatrick is (571) 270-6255.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO

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Atiba Fitzpatrick

/A. O. F./

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